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REMARKS

Reconsideration and further examination is respectfully requested. Claims 1-52 are currently pending in this application.

Rejections under 35 U.S.C. §102(e)

Claims 1-5, 9-22 and 26-34 were rejected under 35 U.S.C. §102(e) as being anticipated by Chaudhuri (US 2002/003864A1)

Chaudhuri et al. (US 2002/003864 A1):

Chaudhuri describes, at paragraph 77:

"...The first-hop router receives a request to create a lightpath from a source. The first-hop router creates a lightpath setup (connection) message and sends it towards the destination of the lightpath where it is received by the last-hop router. If the originator of the request is not the source, the originator tunnels the request to the first-hop router. The lightpath setup is sent from the first-hop router on the default-routed lightpath as the payload of a normal IP packet with router alert. A router alert ensures that the packet is processed by every router in the path. A channel is allocated for the lightpath on the downstream link at every node traversed by the setup message. The identifier of the allocated channel is written to the setup message, which is then sent to the next node along the selected route. If no channel is available on some link, the setup fails, and a message is returned to the first-hop router informing it that the lightpath cannot be established. ..." (Emphasis added by Applicant)

Thus Chaudhuri describes a system and method for establishing light paths, where all switches in the light path are hard-configured in response to the connection request. Chaudhuri further states, at paragraph 77 "...After a channel has been allocated at a node and the setup message has been sent on to the next node along the route, the router communicates with the OLXC to reconfigure the OLXC to provide the desired connectivity..."

With regard to control information, Chaudhuri states at paragraph 46:

"...On each link within the network, one channel is assigned as the default routed (one hop) lightpath. The routed lightpath provides router-to-router connectivity between adjacent

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nodes over this link. These routed lightpaths reflect (and are thus identical to) the physical

topology.... All control messages are sent in-band on a routed lightpath as regular IP datagrams,

potentially mixed with other data but with the highest forwarding priority. Control traffic may

use any routed path....."

Accordingly, Chaudhuri a connection oriented system that uses pre-defined channels for

forwarding control data to set up 'lightpaths.'

In contrast to Chaudhuri, the claimed invention recites "...A network device comprising

... optical switching logic coupled between a plurality of input optical interfaces and a plurality

of output optical interfaces, for selectively forwarding an optical data stream having a given

wavelength *to either one of the optical interfaces* for output on at least one optical fiber *or to*

routing logic; and wherein the routing logic is operably coupled to the switching logic to

selectively receive the optical data stream from the optical switching logic and retrieve routing

information from the optical data stream, wherein the routing information is used to dynamically

control the forwarding of subsequent optical data streams *transmitted at the given wavelength*

through the optical switch logic to one of the output optical interfaces on the at least one optical

fiber..."

Thus, in the claimed invention, an optical data stream having a given wavelength may

either be forwarded to the routing logic or forwarded through the switch. As described at page

3, lines 15-24 of the specification of Applicant's application, one advantage of such an

arrangement is that "the optical switch router can pass through an optical data stream during one

period of time and drop the optical data stream for local processing during another period of

time. The optical switch router only needs to convert an optical data stream from optical form

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into electrical form during that period that the optical data stream is being dropped for local

processing by the optical switch router."

Such an arrangement is fundamentally different than that described in Chaudhuri, which,

as described in paragraph 48, dedicates a specific wavelength for routing and control

information. In contrast, in the claimed invention, each wavelength can be used for carrying

either control information or data, thereby making greater use of the bandwidth of the optical

system. In addition, while Chaudhuri's arrangement allows only source routing to be performed,

the present invention, by providing a mechanism by which routing can be dynamically altered at

each node, permits hop by hop routing protocols to be used. As described at page 7, lines 21-29

of Applicant's specification:

"... Dynamic configuration of the optical switching logic 210 can be accomplished using

any of a variety of mechanisms. For one example, the optical switching logic 210 may be

dynamically configured under control of the routing logic 240, particularly as network routes

change pursuant to a routing protocol, such as Routing Information Protocol (RIP) or Open

Shortest Path First (OSPF)...." The source routed system of Chaudhuri does not have the ability

to 'dynamically control the forwarding of subsequent optical data streams' as recited in the

claims.

In order to support a rejection under 35 U.S.C. §102(e) *every* limitation of the claims

must be shown or suggested in the prior art. For at least the reason that Chaudhuri fails to

describe or suggest several limitations of independent claim 1, including " selectively forwarding

an optical data stream having a given wavelength to either one of the optical interfaces for output

on at least one optical fiber or to routing logic..." and retrieving "... routing information from

the optical data stream, wherein the routing information is used to dynamically control the

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forwarding of subsequent the optical data stream streams transmitted at the given wavelength

through the optical switch logic…" Claim 1 is patentably distinct over Chaudhuri, and the

rejection should be withdrawn.

Independent claims 18 and 35 include limitations similar to those that differentiate claim

1 over Chaudhuri and for at least this reason, those claims are also patentably distinct over

Chaudhuri, and the rejection should be withdrawn. Dependent claims 2-17, 19-34 and 36-49 are

dependent claim sets which server to add further distinctive limitations to their respective parent

claims 1, 18 and 35, but are allowable for at least the reason put forth above with regard to their

parent claims.

Rejections under 35 U.S.C. §103

Claims 6-8 and 23-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over

Chaudhuri.   Applicants submit that even if a motivation could be found in Chaudhuri for the

various modifications suggested by the Examiner, the modified teachings still do not overcome

the inadequacies of Chaudhuri described above with regard to the independent claims 1, 18 and

35. For at least this reason, claims 6 -8 and 23-25 are patentable over Chaudhuri, and the

rejection should be withdrawn.

Claims 35-49 were rejected under 35 U.S.C. §103(a) as being unpatentable over

Chaudhuri et al. in view of Kirby (U.S. 6,647,208) B1.

Kirby:

Kirby describes, at lines 27-39:

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"...based on the core network topology, hybrid switch circuits communicate amongst each other and peripheral nodes over at least a first dedicated wavelength to establish a flow path and assign a wavelength to be used for routing optical data signals. Each hybrid switch circuit includes an optical switch for switching optical signals based on the assigned wavelength to an optical fiber in the established flow path... Additionally, each hybrid switch circuit includes an electronic controller for monitoring traffic on the first dedicated wavelength and controlling the associated optical switch. *Once a flow path is established, data is transferred on an assigned wavelength between peripheral nodes on the core network. ...*" (Emphasis added by Applicant)

Kirby further states, at column 6, lines 21-25:

"... Optical switch 205, on the other hand, is a slave device that directs data from optical inputs 230 to optical outputs 247 through flow paths based upon settings issued by optical switch control processor 210 <u>rather than upon destination information encoded within the signals themselves.</u> Routing an optical signal based on information within a given data packet is less efficient because the entire contents of such a data packet or optical signal must be stored and, after determining the destination of the signal based on information within the signal, the original signal and its contents must be re-created and transmitted to the appropriate destination..." (Emphasis added by Applicant)

It is clear, from reviewing the figures and specification of Kirby that Kirby describes a source routed system, wherein the path from a source to a destination node is determined at the source and propagated through the intermediate nodes to the destination using the dedicated channel T1 (232 in Figure 2). That is, a circuit is set up between the source and the destination. For example, Kirby describes, at column 7, lines 10-11 "...the dedicated wavelength T1 supports the setup of data transfers between two or more regional networks..." Kirby teaches against 'using destination information encoded within the signals themselves...' as 'inefficient', but rather dedicates a separate channel for control.

In order to support a rejection under 35 U.S.C. §103, *every* limitation of the claims should be shown or suggested by the combination of references. Applicants' submit that the

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combination of Kirby and Chaudhuri fails to meet this requirement for at least the following

reasons.

Applicants' claim 35 recites "...An optical line card for use in a networking device, the

optical line card comprising ... a router interface; and ... optical switching logic operably coupled

to receive an incoming optical data stream having a given wavelength from an incoming optical

fiber over an incoming optical interface and selectively pass the incoming optical data stream

either through to an outgoing optical fiber over an outgoing optical interface or to the router

interface for processing by routing logic, wherein the routing logic is operably coupled to the

switching logic to selectively receive the optical data stream from the optical switching logic and

retrieve routing information from the optical data stream, wherein the routing information is used

to dynamically control the forwarding of subsequent incoming optical data streams transmitted at

the given wavelength through the optical switch logic to the outgoing optical fiber...."

Accordingly, as described above with regard to Chaudhuri, the claimed invention

includes the capability of 'retrieving routing information from the optical data stream' and

controlling the optical switch to 'selectively pass the incoming optical data stream either through

to an outgoing optical fiber ... or to the router interface ...' in response to the retrieved routing

information. No such structure is shown or suggested in Chaudhuri or Kirby, or the combination

thereof. As described above Chaudhuri forwards lightpath connection requests to routers on a

pre-determined control channel. There is no mention of data being forwarded either to a router

or out the switch based on previously received routing information in Chaudhuri. Similarly,

Kirby describes a system which uses source routing over a dedicated channel. The combination

of reference similarly fails to disclose this limitation. Accordingly, for at least this reason it is

respectfully submitted that the rejection is overcome and should be withdrawn. Dependent

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claims 36-49 serve to further limit claim 35 and are allowable for at least the reasons put forth

with regard to claim 35.

Conclusion:

Applicants have made a diligent effort to place the claims in condition for allowance.

However, should there remain unresolved issues that require adverse action, it is respectfully

requested that the Examiner telephone Lindsay G. McGuinness, Applicants' Attorney at 978-264-

6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now

considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

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